



**FCC CFR47 PART 15 SUBPART B  
ICES-003 ISSUE 4, 2004-02  
DECLARATION OF CONFORMITY TEST REPORT**

**FOR**

**USB MODEM**

**MODEL NUMBER: COMPASS 597**

**FCC ID: N7NC597**

**IC: 2417C-C597**

**REPORT NUMBER: 07U11455-2**

**ISSUE DATE: JANUARY 16, 2008**

*Prepared for*

**SIERRA WIRELESS  
2290 COSMOS CT.  
CARLSBAD, CA 92010, U.S.A**

*Prepared by*

**COMPLIANCE CERTIFICATION SERVICES  
47173 BENICIA STREET  
FREMONT, CA 94538, U.S.A.  
TEL: (510) 771-1000  
FAX: (510) 661-0888**

**NVLAP®**

NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	1/16/08	Initial Issue	T. Chan

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS.....</b>	<b>4</b>
<b>2. TEST METHODOLOGY .....</b>	<b>5</b>
<b>3. FACILITIES AND ACCREDITATION.....</b>	<b>5</b>
<b>4. CALIBRATION AND UNCERTAINTY .....</b>	<b>5</b>
4.1. <i>MEASURING INSTRUMENT CALIBRATION.....</i>	<i>5</i>
4.2. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>5</i>
<b>5. EQUIPMENT UNDER TEST .....</b>	<b>6</b>
5.1. <i>DESCRIPTION OF EUT.....</i>	<i>6</i>
5.2. <i>TEST CONFIGURATIONS.....</i>	<i>6</i>
5.3. <i>MODE(S) OF OPERATION.....</i>	<i>6</i>
5.4. <i>SOFTWARE AND FIRMWARE.....</i>	<i>7</i>
5.5. <i>MODIFICATIONS.....</i>	<i>7</i>
5.6. <i>DETAILS OF TESTED SYSTEM .....</i>	<i>8</i>
<b>6. TEST AND MEASUREMENT EQUIPMENT .....</b>	<b>10</b>
<b>7. APPLICABLE LIMITS AND TEST RESULTS .....</b>	<b>11</b>
7.1. <i>RADIATED EMISSIONS .....</i>	<i>11</i>
7.2. <i>AC MAINS LINE CONDUCTED EMISSIONS .....</i>	<i>22</i>
<b>8. SETUP PHOTOS.....</b>	<b>26</b>

## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SIERRA WIRELESS  
2290 COSMOS CT.  
CARLSBAD, CA 92010, USA

**EUT DESCRIPTION:** USB MODEM

**MODEL:** COMPASS 597

**SERIAL NUMBER:** 2079

**DATE TESTED:** DECEMBER 19-21, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART B	No Non-Compliance Noted
ICES-003 ISSUE 4, 2004-02	No Non-Compliance Noted

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:



Tested By:



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THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

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CHIN PANG  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and ICES-003 ISSUE 4, 2004-02.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Power Line Conducted Emission	+/- 2.3 dB
Radiated Emission	+/- 3.4 dB

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a dual band 800 / 1900MHz USB Modem CDMA Module, and manufactured by Sierra Wireless, Inc.

#### GENERAL INFORMATION

CHASSIS MATERIAL	METAL
ENCLOSURE MATERIAL	PLASTIC
POWER REQUIREMENTS	100-240 VAC / 50-60 Hz
POWERLINE FILTER MANUFACTURER AND MODEL	BUILT-IN
LIST OF ALL OSCILLATOR FREQUENCIES GREATER THAN OR EQUAL TO 9 kHz	2.0 GHz CPU

### 5.2. TEST CONFIGURATIONS

The following configurations were investigated during preliminary testing:

EUT Configuration	Description
Typical	EUT connected to the laptop and printer, USB Mouse also connected to the Laptop

### 5.3. MODE(S) OF OPERATION

Mode	Description
Receiving & EMCTest	Receiving & I/O ports activated with H' patterns scrolling on the screen display.

#### **5.4. SOFTWARE AND FIRMWARE**

The test software used during the test was EMCTest software.

#### **5.5. MODIFICATIONS**

No modifications were made during testing.

## 5.6. DETAILS OF TESTED SYSTEM

### SUPPORT EQUIPMENT & PERIPHERALS

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Printer	Microline 186	D22300A	AE5A048148A0	DoC
USB Mouse	Logitech	90.00026.7730	HCA55002169	DoC
Modem	Hayes	4714US	A02247143261	BFJUSA-31719-M5-E
Laptop	Toshiba	PSDAGU-00J00V	37065149W	DoC
Laptop AC dapter	Targus	APM12	R0708027330	DoC

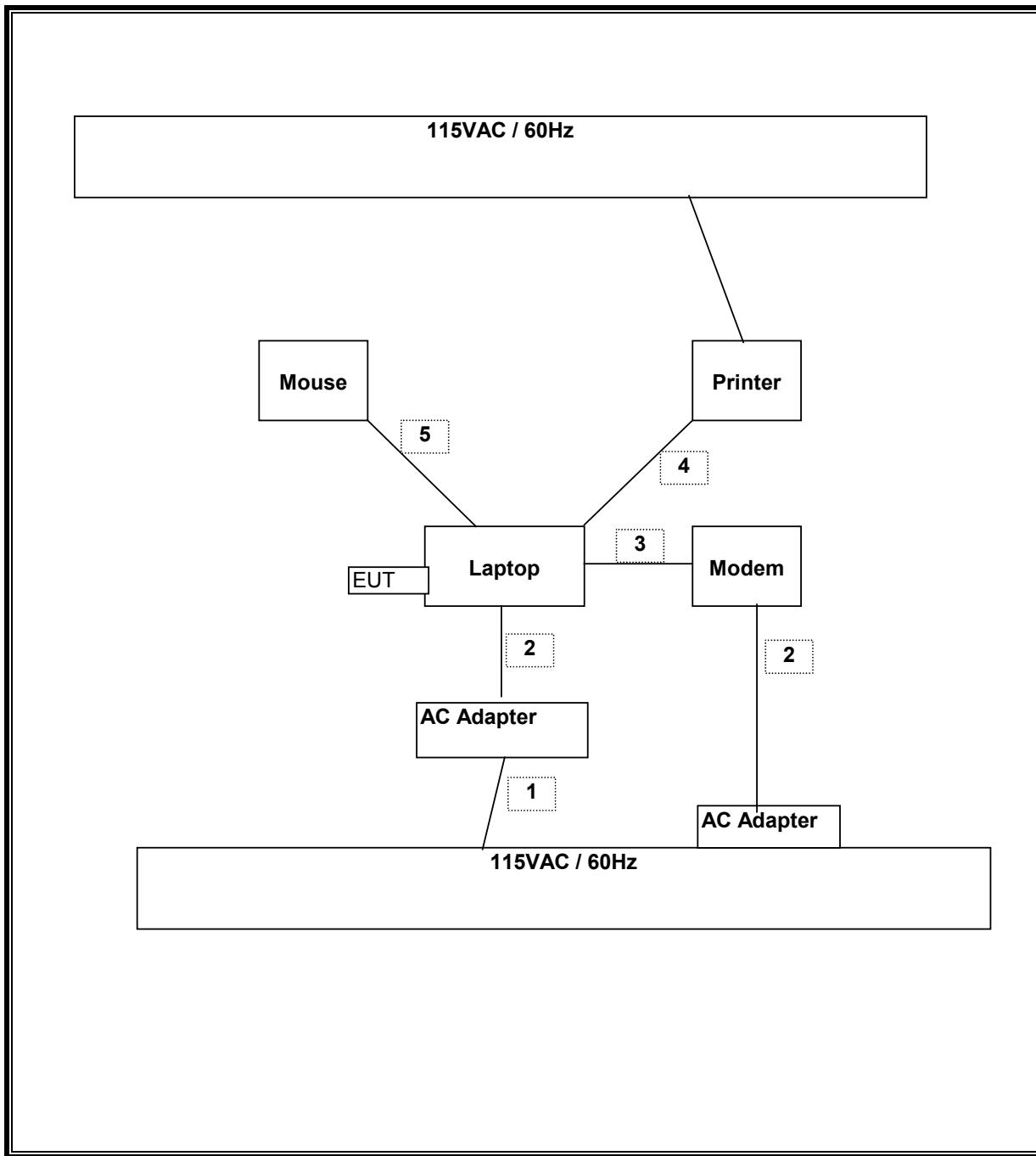
### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-shielded	2m	NA
2	DC	2	US 115V	Un-shielded	1m	NA
3	RJ11	1	Modem	Un-shielded	2m	NA
4	USB	1	Printer	Un-shielded	2m	NA
5	USB	1	Mouse	Un-shielded	2m	NA

### TEST SETUP

The EUT is installed in a typical configuration. Test software exercised the EUT.

TEST SETUP DIAGRAM



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	8/7/2008
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	9/28/2008
Power Sensor	Agilent	E9327A	C00964	12/7/2008
Peak Power Meter	Agilent / HP	E4416A	C00963	12/7/2008
Antenna, Horn, 18 GHz	EMCO	3115	C00945	4/15/2008
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	10/25/2008
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	1/27/2008
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	9/27/2008
Preamplifier, 1300 MHz	Agilent / HP	8447D	NA	5/9/2008

## 7. APPLICABLE LIMITS AND TEST RESULTS

### 7.1. RADIATED EMISSIONS

#### TEST PROCEDURE

ANSI C63.4

The highest clock frequency generated or used in the EUT is 2 GHz, therefore the frequency range was investigated from 30 MHz to 10GHz.

#### LIMIT

§15.109 (g) As an alternative to the radiated emission limits shown in paragraphs (a) and (b) of this section, digital devices may be shown to comply with the standards contained in Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment—Radio Disturbance Characteristics—Limits and Methods of Measurement" (incorporated by reference, see §15.38). In addition:

(1) The test procedure and other requirements specified in this part shall continue to apply to digital devices.

(2) If, in accordance with §15.33 of this part, measurements must be performed above 1000 MHz, compliance above 1000 MHz shall be demonstrated with the emission limit in paragraph (a) or (b) of this section, as appropriate. Measurements above 1000 MHz may be performed at the distance specified in the CISPR 22 publications for measurements below 1000 MHz provided the limits in paragraphs (a) and (b) of this section are extrapolated to the new measurement distance using an inverse linear distance extrapolation factor (20 dB/decade), e.g., the radiated limit above 1000 MHz for a Class B digital device is 150 uV/m, as measured at a distance of 10 meters.

(3) The measurement distances shown in CISPR Pub. 22, including measurements made in accordance with this paragraph above 1000 MHz, are considered, for the purpose of §15.31(f)(4) of this part, to be the measurement distances specified in this part.

(4) If the radiated emissions are measured to demonstrate compliance with the alternative standards in this paragraph, compliance must also be demonstrated with the conducted limits shown in §15.107(e).

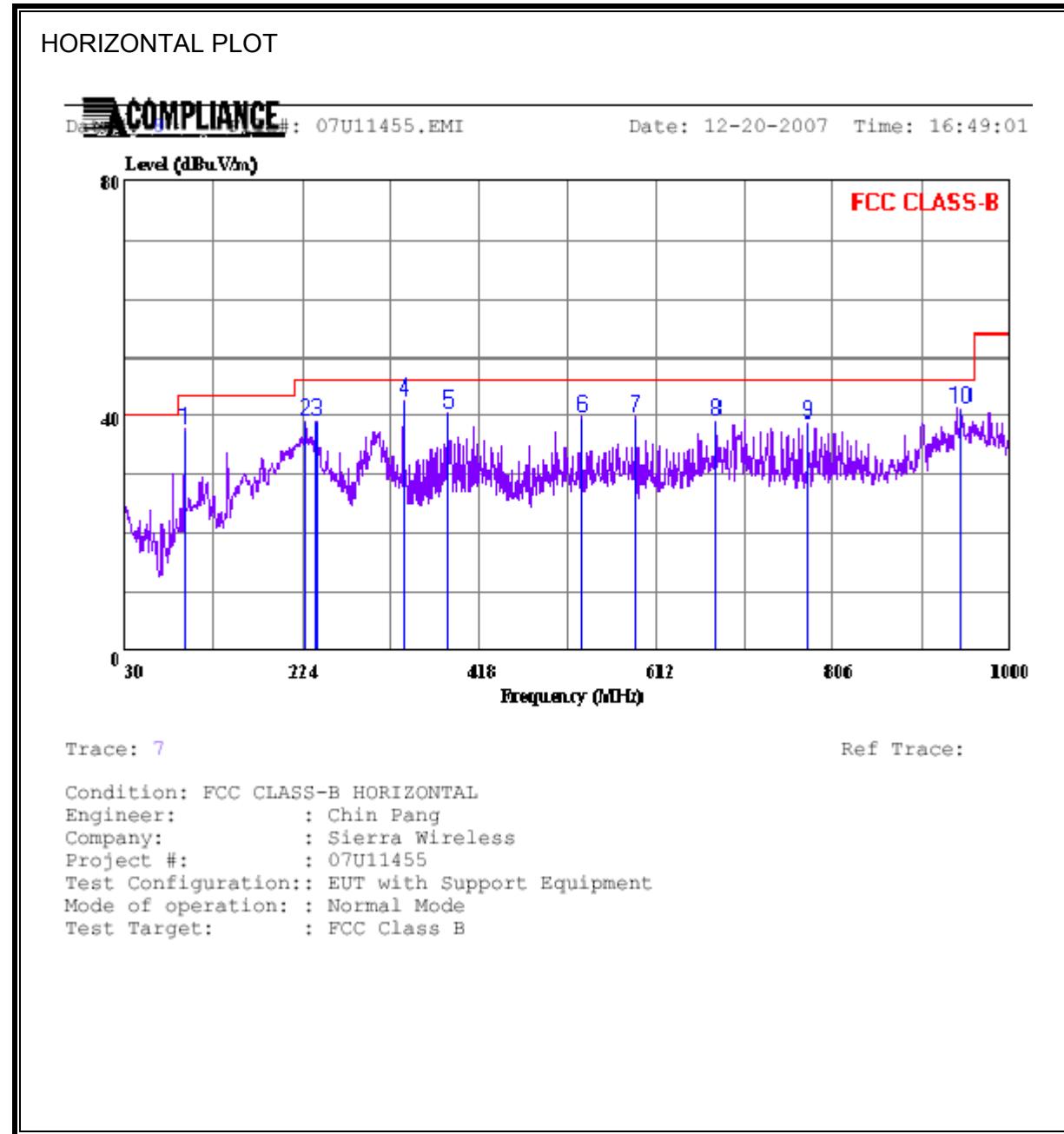
Limits for radiated disturbance of Class B ITE at measuring distance of 10 m	
Frequency range (MHz)	Quasi-peak limits (dB $\mu$ V/m)
30 to 230	30
230 to 1000	37
Note: The lower limit shall apply at the transition frequency.	

Limits for radiated disturbance of Class B ITE at measuring distance of 3 m		
Frequency range (MHz)	Peak limits (dB $\mu$ V/m)	Average limits (dB $\mu$ V/m)
Above 1000	74	54

## RESULTS

No non-compliance noted:

**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

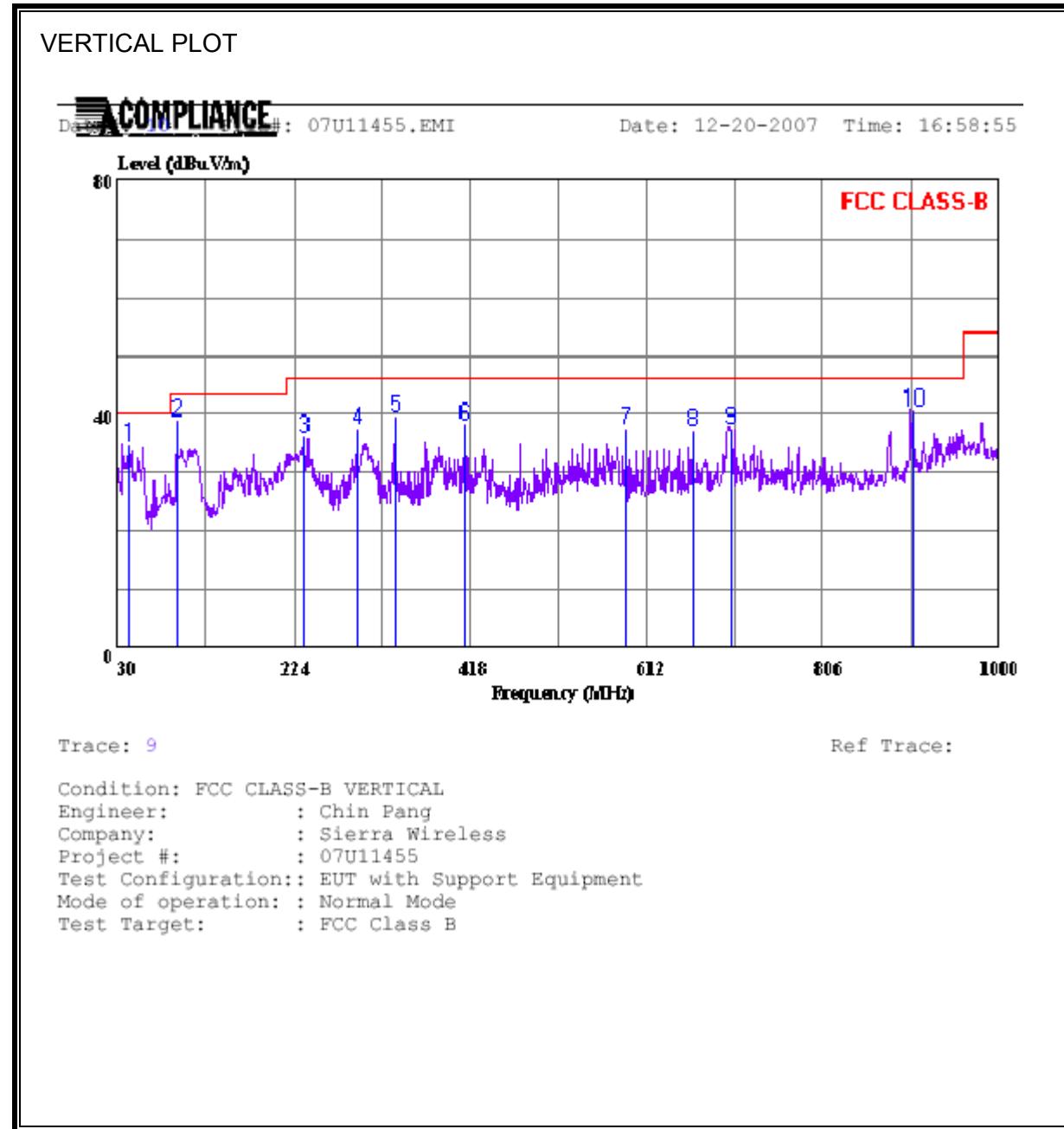


HORIZONTAL DATA

Page: 1

		Read		Limit	Over	
Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	94.990	56.20	-18.29	37.91	43.50	-5.59 Peak
2	227.880	54.10	-14.93	39.17	46.00	-6.83 Peak
3	239.520	53.60	-14.53	39.07	46.00	-6.93 Peak
4	335.550	53.80	-11.37	42.43	46.00	-3.57 Peak
5	383.080	50.60	-10.25	40.35	46.00	-5.65 Peak
6	530.520	46.60	-6.76	39.84	46.00	-6.16 Peak
7	589.690	45.30	-5.60	39.70	46.00	-6.30 Peak
8	677.960	43.00	-3.88	39.12	46.00	-6.88 Peak
9	777.870	41.00	-2.39	38.62	46.00	-7.38 Peak
10	945.680	42.10	-0.86	41.24	46.00	-4.76 Peak

**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)**



VERTICAL DATA

Page: 1

Freq	Read		Level	Limit	Over		Remark
	Level	Factor			Line	dB	
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	42.610	48.90	-14.27	34.63	40.00	-5.37	Peak
2	94.990	57.10	-18.29	38.81	43.50	-4.69	Peak
3	234.670	50.60	-14.69	35.91	46.00	-10.09	Peak
4	293.840	49.90	-12.48	37.42	46.00	-8.58	Peak
5	335.550	51.00	-11.37	39.63	46.00	-6.37	Peak
6	412.180	47.60	-9.55	38.05	46.00	-7.95	Peak
7	589.690	43.00	-5.60	37.40	46.00	-8.60	Peak
8	662.440	41.40	-4.21	37.19	46.00	-8.81	Peak
9	704.150	40.90	-3.40	37.50	46.00	-8.50	Peak
10	904.940	41.60	-1.04	40.56	46.00	-5.44	Peak

**L704 and C705 changed to improve Antenna Matching:**

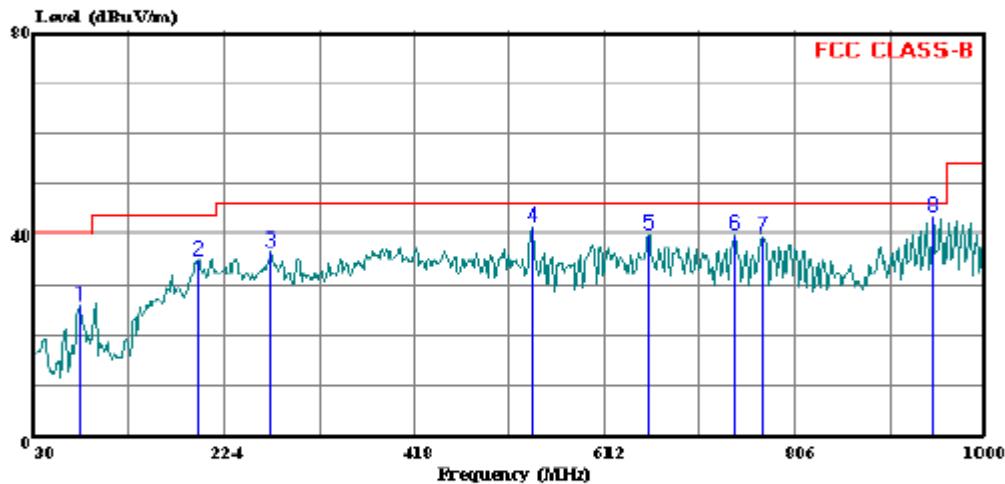
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)**

HORIZONTAL PLOT



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 19 File#: 07U11455.emi Date: 01-19-2008 Time: 10:15:25



Trace: 18

Ref Trace:

Condition: FCC CLASS-B HORIZONTAL  
Engineer: : Chin Pang  
Company: : Sierra Wireless  
Project #: : 07U11455  
Test Configuration: : EUT with Support Equipment  
Mode of operation: : Normal Mode  
Test Target: : FCC Class B  
: With Qualcomm new chip

HORIZONTAL DATA

Page: 1

Freq	Read			Limit		Over Line Limit	Remark
	Level	Factor	Level	dBuV/m	dBuV/m		
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	75.590	48.60	-22.64	25.96	40.00	-14.05	Peak
2	197.810	52.22	-17.31	34.91	43.50	-8.59	Peak
3	271.530	53.65	-17.09	36.56	46.00	-9.44	Peak
4	538.280	51.94	-10.77	41.17	46.00	-4.83	Peak
5	656.620	48.87	-9.21	39.66	46.00	-6.34	Peak
6	744.890	47.99	-8.02	39.97	46.00	-6.03	Peak
7	773.990	46.96	-7.41	39.55	46.00	-6.45	Peak
8	948.590	47.46	-4.20	43.26	46.00	-2.74	Peak

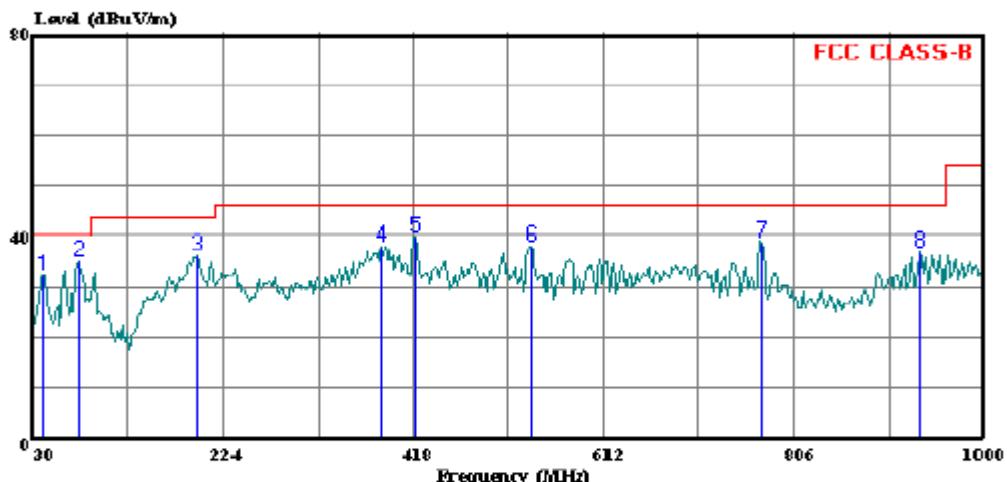
**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)**

**VERTICAL PLOT**



Compliance Certification Services  
47173 Benicia Street  
Fremont, CA 94538  
Tel: (510) 771-1000  
Fax: (510) 661-0888

Data#: 21 File#: 07U11455.emi Date: 01-19-2008 Time: 10:23:32



Trace: 20

Ref Trace:

Condition: FCC CLASS-B VERTICAL  
Engineer: : Chin Pang  
Company: : Sierra Wireless  
Project #: : 07U11455  
Test Configuration: : EUT with Support Equipment  
Mode of operation: : Normal Mode  
Test Target: : FCC Class B  
: With Qualcomm new chip

VERTICAL DATA

Page: 1

		Read		Limit	Over	
Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB
1	40.670	48.07	-15.49	32.58	40.00	-7.42 Peak
2	75.590	57.80	-22.64	35.16	40.00	-4.84 Peak
3	196.840	53.75	-17.53	36.22	43.50	-7.28 Peak
4	385.990	51.80	-13.84	37.96	46.00	-8.04 Peak
5	419.940	52.82	-13.06	39.76	46.00	-6.24 Peak
6	539.250	48.71	-10.78	37.93	46.00	-8.07 Peak
7	773.990	46.27	-7.41	38.86	46.00	-7.14 Peak
8	935.980	41.56	-4.56	37.00	46.00	-9.00 Peak

**SPURIOUS EMISSIONS ABOVE 1000 MHz (WORST-CASE CONFIGURATION)**

High Frequency Measurement  
Compliance Certification Services, Fremont 5m Chamber

Company: Sierra Wireless  
Project #: 07U11455  
Date: 12/20/2007  
Test Engineer: Chin Pang  
Configuration: EUT/Basic Support Equipment  
Mode: Normal

**Test Equipment:**

Horn 1-18GHz	Pre-amplifier 1-26GHz	Pre-amplifier 26-40GHz	Horn > 18GHz	Limit											
T73; S/N: 6717 @3m	T145 Agilent 3008A005			FCC 15.209											
Hi Frequency Cables															
2 foot cable	3 foot cable	12 foot cable	HPF	Reject Filter											
		B-5m Chamber													
<b>Peak Measurements</b> RBW=VBW=1MHz															
<b>Average Measurements</b> RBW=1MHz, VBW=10Hz															
f GHz	Dist (m)	Read Pk dBuV	Read Avg. dBuV	AF dB/m	CL dB	Amp dB	D Corr dB	Fltr dB	Peak dBuV/m	Avg dBuV/m	Pk Lim dBuV/m	Avg Lim dBuV/m	Pk Mar dB	Avg Mar dB	Notes (V/H)
1.001	3.0	66.6	40.3	25.7	3.2	-36.1	0.0	0.0	59.4	33.1	74	54	-14.6	-20.9	V
1.340	3.0	58.0	35.6	26.6	3.7	-35.9	0.0	0.0	52.4	30.0	74	54	-21.6	-24.0	V
1.606	3.0	55.0	34.5	27.3	4.0	-35.7	0.0	0.0	50.7	30.2	74	54	-23.3	-23.8	V
2.008	3.0	60.5	38.0	28.4	4.5	-35.4	0.0	0.0	58.1	35.6	74	54	-15.9	-18.4	V
1.005	3.0	63.5	45.6	25.7	3.2	-36.1	0.0	0.0	56.3	38.4	74	54	-17.7	-15.6	H
1.338	3.0	57.8	35.2	26.6	3.7	-35.9	0.0	0.0	52.2	29.6	74	54	-21.8	-24.4	H
2.008	3.0	61.0	38.0	28.4	4.5	-35.4	0.0	0.0	58.6	35.6	74	54	-15.4	-18.4	H
Rev. 4.127															
f	Measurement Frequency			Amp	Preamp Gain						Avg Lim	Average Field Strength Limit			
Dist	Distance to Antenna			D Corr	Distance Correct to 3 meters						Pk Lim	Peak Field Strength Limit			
Read	Analyzer Reading			Avg	Average Field Strength @ 3 m						Avg Mar	Margin vs. Average Limit			
AF	Antenna Factor			Peak	Calculated Peak Field Strength						Pk Mar	Margin vs. Peak Limit			
CL	Cable Loss			HPF	High Pass Filter										

## 7.2. AC MAINS LINE CONDUCTED EMISSIONS

### TEST PROCEDURE

ANSI C63.4

### LIMIT

§15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Notes:

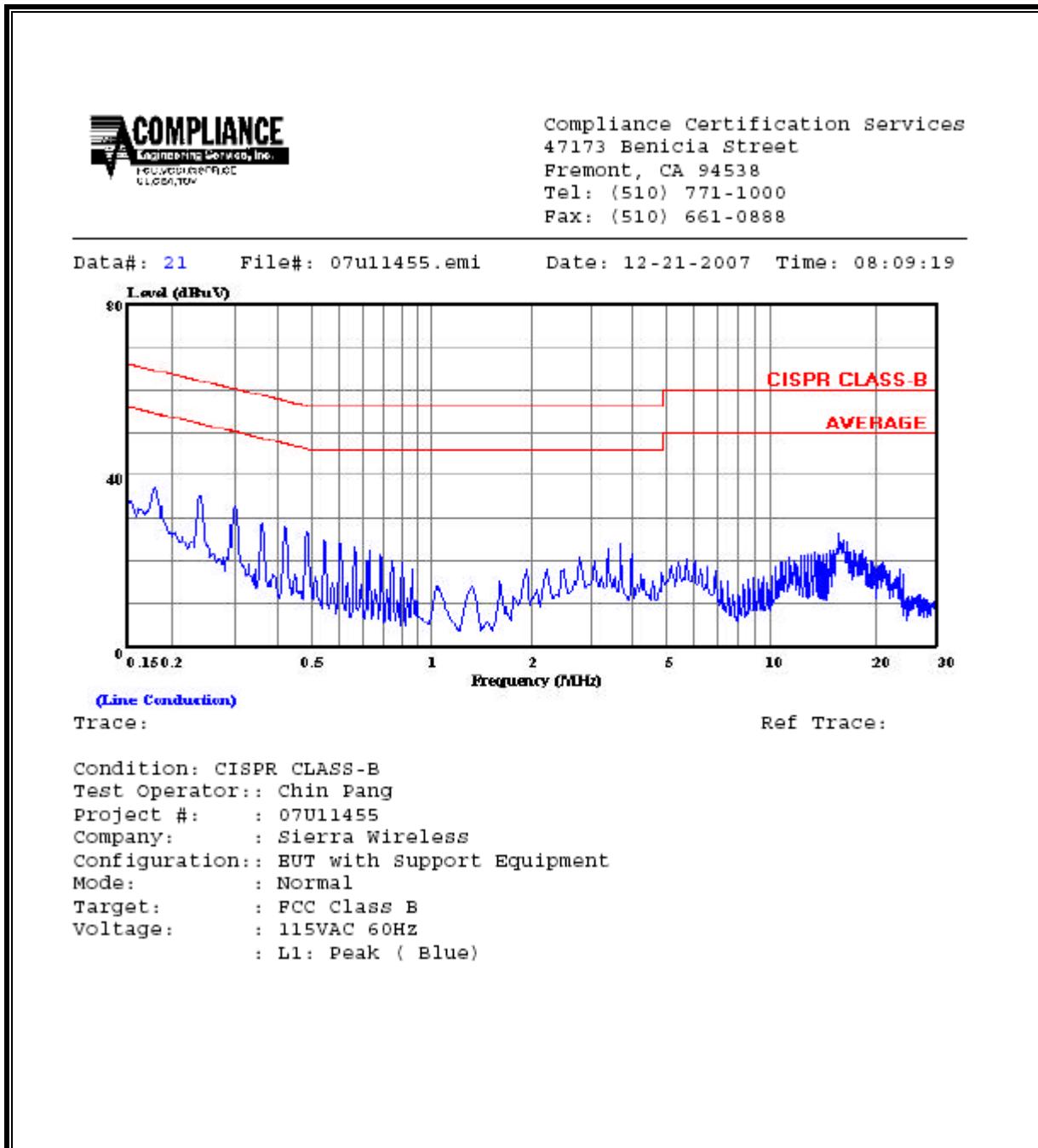
1. The lower limit shall apply at the transition frequencies
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### RESULTS

**6 WORST EMISSIONS**

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq. (MHz)	Reading			Closs (dB)	Limit QP	EN_B AV	Margin		Remark L1 / L2
	PK (dBuV)	QP (dBuV)	AV (dBuV)				QP (dB)	AV (dB)	
0.18	36.68	--	--	0.00	64.44	54.44	-27.76	-17.76	L1
0.24	35.31	--	--	0.00	62.10	52.10	-26.79	-16.79	L1
15.80	26.28	--	--	0.00	60.00	50.00	-33.72	-23.72	L1
0.18	36.18	--	--	0.00	64.49	54.49	-28.31	-18.31	L2
0.24	33.31	--	--	0.00	62.10	52.10	-28.79	-18.79	L2
3.53	25.00	--	--	0.00	56.00	46.00	-31.00	-21.00	L2
6 Worst Data									

**LINE 1 RESULTS**



**LINE 2 RESULTS**

